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Vol. 9, No. 5. December, 1939.

Accidents.

Farms and rural safety. By J. M. Baggott. Farm machinery and equipment. No.1867. July, 1939. p.26.

Agriculture.

Agriculture as a potential source of raw materials for industry. By Harold Hartley. Mather lecture, 1937. Reprinted from the Journal of the Textile Institute. v.28,no.7. July, 1937. p.151-172.

Annual report of the Maine extension service for the year ending June 30, 1939. Orono, Me., 1939. 40p. University of Maine. College of agriculture. Extension bulletin no.267.

Fifty-first annual report, 1937-1938, Vermont agricultural station. By J. L. Hills. Burlington, Vt., 1938. 35p. University of Vermont and State agricultural college. Vermont agricultural experiment station. Bulletin no.438.

Fifty-first annual report, 1938. Texas agricultural experiment station. College Station, Texas., 1939. 281p.

Food and life: yearbook of agriculture, 1939. U. S. Department of agriculture. Washington, U. S. Govt.print.off., 1939. 1165p.

Selected references on the history of English agriculture. By E. E. Edwards. Washington, D. C., 1939. 105p. mimeographed. U. S. Department of agriculture. Library. Bibliographical contributions no.24.

Serving farm people on many fronts; 1937 annual report of the Extension service. U. S. Department of agriculture. Washington, U.S. Govt.print.off., 1939. 40p.

Air Conditioning.

Air-conditioning a calf barn. By Mrs. A. K. Wightman. Farmer's digest. v.3,no.5. September, 1939. p.23-25.

Basic problems in the air conditioning of stables. By M. A. R. Kelley. Agricultural engineering. v.20,no.11. November, 1939. p.439-441.

Air Conditioning. (Cont'd).

Smoke hazards of air-conditioning systems. New York, National board of fire underwriters, 1939. 15p.

Winter air conditioning: forced warm-air heating. Edited by S. Konzo. Columbus, Ohio, National warm air heating and air conditioning association, c1939. 532p. Based primarily on results of research on the subject at the University of Illinois as published in University of Illinois Engineering experiment station bulletin no.266. Supplemented with data from other sources.

Alcohol Fuel.

Carbon monoxide in engine exhaust using alcohol blends. By L. C. Lichty and C. W. Phelps. New Haven, Conn., 1937. 14p. "Literature cited": p.14. Yale university. Publications from the School of engineering. Serial no.22. Reprinted from Industrial and engineering chemistry, v.30,no.5. May, 1937.

Engine performance with gasoline and alcohol. By L. C. Lichty and E. J. Ziurys. New Haven, Conn., 1936. 21p. "Literature cited": p.20-21. Yale university. Publications from the School of engineering. Serial no.16. Reprinted from Industrial and engineering chemistry, v.29,no.9. September, 1936.

Motor fuels from farm products. By P. Burke Jacobs. Agricultural engineering. v.20,no.11. November, 1939. p.433-436. Table gives estimated cost of a power alcohol program during the years 1930 to 1937.

Barns.

New barns. By Cordell Tindall. Missouri ruralist. v.80,no.20. September 30, 1939. p.6. Built for new methods of farming.

Basements.

Tile has built-in drain system to keep basement dry. Popular mechanics. v.72,no.5. November, 1939. p.700. Basements are kept dry by tile with built-in drainage feature consisting of channels to guide water from top to bottom of foundation and into drain pipe at base. Easy to keep clean, tiles are furnished glazed or unglazed, and it is claimed they will not shrink or crack or require repairs or painting.

Building Construction.

Building research. Engineering. v.148,no.3841. August 25, 1939. p.219-221. General survey of Annual report, Great Britain building research board.

Charts for concrete column design. By R. B. H. Begg. Blacksburg, Va., 1939. 19p. Virginia polytechnic institute. Engineering experiment station series. Bulletin no.40.

Building Construction. (Cont'd).

Fatigue tests of connection angles. By W. M. Wilson and J. V. Coombe. Urbana, Ill., 1939. 24p. University of Illinois. Engineering experiment station. Bulletin series no.317.

Settlement stresses in continuous frames. By G. E. Large. Columbus, Ohio, 1939. 47p. Ohio state university. Engineering experiment station. Bulletin no.102.

Stress, strain, and structural damage. By H. F. Moore. Urbana, Illinois, 1939. 24p. University of Illinois. Engineering experiment station. Reprint series no.15.

Building Materials.

Construction with plywood. By Oscar Fisher. Pencil points. v.20,no.11. November, 1939. p.751-760.

Effect of range of stress on the torsional fatigue strength of steel. By J. O. Smith. Urbana, Illinois, 1939. 38p. University of Illinois. Engineering experiment station. Bulletin series no.316.

Laboratory tests of concretes and mortars exposed to weak acids. By Dalton G. Miller and others. Agricultural engineering. v.20,no.11. November, 1939. p.427-430. Test method described was devised primarily to facilitate laboratory studies of durability of portland cement mortars and concretes exposed in farm silos to corrosive action of silage. Method and equipment seem to be well adapted to study of corrosive action of soluble materials in general on products of various types.

Sawdust concrete has advantage. Farmer's digest. v.3,no.2. June, 1939. p.59-61. Makes light, strong building material.

Square sections of reinforced concrete under thrust and nonsymmetrical bending. By Paul Andersen. Minneapolis, Minn., 1939. 42p. University of Minnesota. Engineering experiment station. Bulletin no.14.

Strength of metals at elevated temperatures. By Richard F. Miller. Mechanical engineering. v.61,no.8. August, 1939. p.589-594.

Canals.

Pilot knob check and wasteway All-American canal. By G. W. Manley and L. E. Cramer. Reclamation era. v.29,no.9. September, 1939. p.225-228.

Corrosion.

Rust prevention by use of slushing materials. Lubrication. v.25,no.9. September, 1939. p.97-108.

Where there's rust there's moisture. Farm machinery and equipment. No.1866. June, 1939. p.26. Way to fight rust is to adopt methods that will insure keeping tin dry.

Cotton Machinery.

Mechanical harvesting of cotton. By H. P. Smith, D. T. Killough, and D. L. Jones. In Fifty-first annual report, 1938. Texas agricultural experiment station. p.106-107.

Cottonseed.

Cottonseed processing links agriculture and industry profitably. By John Leahy. Southern power and industry. v.57,no.10. October, 1939. p.37-44. New uses for cottonseed products and competition from other vegetable oils will cause modernization of processing plants.

Cottonseed processing research: letters from John P. Ferris, Victor Wichum and W. R. Woolrich. Mechanical engineering. v.61,no.8. August, 1939. p.618-619. Reporting for A.S.M.E. Special Research committee on Cottonseed Processing, Dean Woolrich has presented technical history of some engineering investigations for industry which is ordinarily thought of in connection with nation's supply of vegetable oils. Additional details concerning oil yields and qualities of oils produced by new pressure cooking process are available in another progress report. Results point to potential increase in oil yield of about 45,000,000 lb. annually, if new process were universally used.

Dams.

Imperial Dam and desilting works on the Colorado River. Engineering. v.148,no.3841. August 25, 1939. p.225-227.

Dryers and Drying.

Curing hay in the barn. By C. E. Wylie. Farmer's digest. v.3,no.3. July, 1939. p.1-5. New process of drying hay in barn has been developed over period of four years at Univ. of Tenn. It has been co-operative project with Tennessee Valley Authority. By new system hay is cut in morning and allowed to lie on ground for approximately four hours. This permits large part of moisture to evaporate from plant but still not enough to make hay shatter or to be low enough in moisture content for safe storing. Floor of loft is tight, with tongue and grooved flooring. On top of this floor is series of wood air ducts. System is adaptation of ordinary air conditioning of large buildings. Main duct through center of barn is very large. Greater distance from place air enters

Dryers and Drying. (Cont'd).

loft, smaller main duct. This is provided in order to keep air pressure uniform throughout this system. Lateral ducts are about 4 ft. apart and extend to within 4 ft. of sides of barn. Air is forced out from these ducts at 1 in. space at bottom of duct at floor. Horizontal ducts seem to be better than vertical ducts because hay may be piled on top of them. In case of vertical ducts there will be tendency for air to escape around ducts instead of going through hay.

Electric Lines.

Economical line construction methods and equipment. By J. R. North. Electrical world. v.112,no.11. September 9, 1939. p.718-720.

Rural line construction. By H. C. Daniels. Qualified contractor. v.4,no.8. August, 1939. p.14-15.

Washington utility to build farm lines. Electrical world. v.112,no.11. September 9, 1939. p.736.
Construction of from 1,000 to 2,000 miles of rural lines in next two or three years is planned by Washington Water Power Co. This program carries out new rural extension policy to bring electricity to thousands of Inland Empire farmers through $1,000,000 dollar extension program financed by $1,500,000 surplus from company's recent $22,000,000 refunding operation. Under new policy, which does not conflict with the plans of REA, Washington Water Power will build up to 2,400 ft. of line for farm customer who agrees to pay monthly minimum of $3. for electric service for first five years, after which regular minimum will apply. Cost of building lines further than 2,400 ft. will be paid in five annual installments, but if customer makes "normal" use of service this money will be refunded on basis of his electric bill.

Electric Wiring.

How to wire your farmstead. By J. Warner Pyles. Rural electrification news. v.5,no.1. September, 1939. p.20-21.
Too many people in development of rural electrification project think in minimum terms. It will only cost half as much to do complete wiring job when first installed, to care for all future uses of electricity.

Electricity on the Farm.

Electric soil pasteurizer. By A. Hustrulid. St. Paul, Minn., 1939. 1p. University of Minnesota. Agricultural engineering news letter. No.92.

Electricity goes to the farm. By Harry Slattery. Extension service review. v.10,no.11. November, 1939. p.164.
REA has been functioning for little more than 4 years. Concrete

Electricity on the Farm. (Cont'd).

results of its work may be indicated by few figures. By Sept. 15, 1939, REA had lent or allotted $249,708,793. Most of this money is to go for building rural distribution lines--approximately 235,000 miles of them, bringing electric service within reach of more than 600,000 farm families. Already 125,000 miles of REA-financed lines are rendering service to 275,000 new users of electricity. When funds currently available have been translated into construction, it is estimated that lines financed by REA will total about quarter of a million miles, offering low-cost service to something like 700,000 families in all.

Greatest electric era... dynamos, motor plants, furnish rural comforts. By E. R. McIntyre. Wisconsin agriculturist and farmer. v.66,no.13. July 1, 1939. p.1,11.

More power to you! By Cordell Tindall. Missouri ruralist. v.80,no.22. October 28, 1939. p.3,10. Missouri farmers are putting new electricity to work.

Motor driven corn shellers. By T. E. Hienton. Electricity on the farm. v.12,no.10. October, 1939. p.8. Single and two-hole shellers may be operated with 1/4 to 1 h.p. motors--cylinder shellers with motors of 1/2 to 5 h.p.-- New equipment available.

Engineering.

Engineer in public service. By Joseph M. Byrne, Jr. Mechanical engineering. v.61,no.10. October, 1939. p.742-744. Author's purpose to consider present position and outlook of engineer in relation to current conditions and to suggest ways in which he may aid in improving them, while at same time bettering himself.

Farm Buildings.

Plan seed corn drying house. Markets. Building Section. October 26, 1939. p.5. Gives working drawing.

Farm Machinery and Equipment.

Better care of machinery. By C. V. Phagan. Farmer's digest. v.3,no.5. September, 1939. p.50-52.

Binder adjustments. By B. A. Jennings. Ithaca, N.Y., 1939. 28p. New York State college of agriculture. Cornell extension bulletin no.417.

Farm equipments in war. By Edwin A. Barnes. Magazine of Wall street. v.64,no.12. September 23, 1939. p.612-613, 636-637. Farm income and ability and willingness of farmer to purchase new equipment naturally are prime factors upon which prosperity of farm equipment industry depend. When farm income

Farm Machinery and Equipment. (Cont'd).

rises, equipment purchases increase. Conversely lower farm income means restricted equipment sales. Parallel between farm income and equipment sales, however, is general rather than close, with farm equipment production and earnings showing extremely wide fluctuations and percentage of both gains and losses has in past been much greater than variations in farm income. It is significant, however, that percentage of farm income being spent for new equipment is increasing. Fifteen years ago sales of farm equipment were less than 3 per cent of farm income. In 1929 percentage was 4.4 per cent and after dropping to 2.7 per cent in 1932, at depths of depression rose to new high at 5.9 per cent in 1937. Last year percentage only dropped to 5.3 per cent. From these percentages, reported trend toward increased mechanization of farming in recent years appears to be substantiated.

Increasing the farm income through better care of machinery. By C. V. Phagan. Southern agriculturist. v.69,no.7. July, 1939. p.5.

Internal-combustion nut cracker. By Roy Bainer and C. E. Barbee. Farmer's digest. v.3,no.5. September, 1939. p.44-46. Purpose of machine is to puncture or cut nut shell, then introduce through this shell aperture, explosive gas mixture to fill space between shell and kernel of nut, and lastly to explode gas to shatter and separate shell from kernel.

Mechanizing the corn harvest. By A. P. Brodell. Agricultural situation. v.23,no.9. September, 1939. p.18-20. Table gives acreage of corn for grain harvested with pickers, and corn harvest rates, by leading states in picker use, and by geographic divisions, 1938.

Old auto made into manure loader. By Curtis Taylor. Western farm life. August 15, 1939. p.6,9.

Farm Mechanics.

How to fit a rip saw. By L. M. Roehl. Electricity on the farm. v.12,no.11. November, 1939. p.15.

Farm Power.

Horse costs compared with tractors. Farm implement news. v.60,no.18. September 7, 1939. p.16. From 1938 report of the Iowa Agricultural experiment station. Study has been made of cost of use of horses, tractors and trucks on 1,911 Iowa farms for years 1936 and 1937. One hundred and fifty survey records were contributed by National Research Project of WPA in 1936, and 50 additional survey records were obtained under this project in 1937. Average net cost of keeping horse on 53 Iowa cooperator horse-operated farms in 1936 and 49 farms in 1937 was $91.44 and $86.08 respectively. Each horse was worked an average

Farm Power. (Cont'd).

of 814 hours in 1936 and 802 hours in 1937, at average cost of 11.2 cents and 10.7 per hour respectively. Cost of operation of tractors was found to average 53 cents an hour on one-plow, general purpose tractors, 51 cents and 61 cents on two-plow and three-plow general purpose tractors and 64 cents and 70 cents per hour on two and three-plow standard tractors.

Fence Posts.

500,000,000 fence posts. By Lucile Nelson. Farmer's digest. v.3,no.4. August, 1939. p.13-15. Non-durable posts can be treated with chemical solution to make them resist insects and decay--and last as long as durable woods. This is now possible because of simple method of treating round, green timbers which has recently been developed at Forest Products Laboratory in Madison, Wisconsin. New method enables farmer to preserve his posts at home, using equipment no more elaborate than old inner tube!

Fertilizer Placement.

Factors of efficiency in the distribution and placement of cottonseed and fertilizers. By H. P. Smith. In Fifty-first annual report, 1938, Texas agricultural experiment station. p.107. Machine placement and soil disturbance studies. Treatment of cottonseed for planting purposes. Width of furrow openers. Effect of press wheels.

Where to put fertilizer. Farmer's digest. v.3,no.2. June, 1939. p.31-33. Results of Minnesota experiments.

Fertilizers.

Fertilizers for Indiana soils and crops. By A. T. Wiancko, G. D. Scarseth, and G. P. Walker. LaFayette, Ind., 1939. 11p. Purdue university. Agricultural experiment station. Circular no.162 (rev. ed.)

Increasing the use of commercial fertilizers in the United States. By C. J. Brand. Rome, Italy, Fédération internationale des techniciens agronomes, 1939. 23p. Reprint from: La Technique Agricole Internationale. v.17,no.2/3. April-Sept. 1939.

Use of commercial fertilizers. By G. S. Fraps and T. L. Ogier. College Station, Texas,1939. 15p. Agricultural and mechanical college of Texas. Division of chemistry. Circular no.85.

Fire Protection.

Farm fires--avoid them! By George W. Kable. Electricity on the farm. v.12,no.10. October, 1939. p.11-12. Annual fire loss on American farms is reported by National Fire Protection Association to be in excess of $100,000,000. Where

Fire Protection. (Cont'd).

farm fires do occur, loss amounts to 85 per cent of property involved, according to Electric Water Systems Council. This is in contrast with only 5 per cent loss in cities. Losses of life, livestock, feed, keepsakes may be covered by insurance but they cannot be replaced by insurance.

Fighting farm fires. By I. W. Dickerson. Pennsylvania farmer. v.121,no.10. November 4, 1939. p.203.

How fires start and how they burn. Address by D. J. Price [at the] Pennsylvania firemen's training conference, State College, Penna., August 28, 1939. Washington, U. S. Bureau of agricultural chemistry and engineering, 1939. 9p. mimeographed. "References": p.9.

Is your home fire-safe? By Harvey Muntz. Western farm life. v.40,no.19. October 1, 1938. p.5-6. Experience reveals that more dwellings are destroyed by fire each year than any other one type of buildings.

Flax.

Flax in the cotton industry. Mechanical engineering. v.61,no.10. October, 1939. p.752-753. Flax has been investigated as to its adaptability to Southern agriculture and utilization of its fibers in cotton-textile industry by scientists of Engineering experiment station of Georgia school of Technology and Tennessee Valley Authority. Subject of investigation reported is solution of twofold problem: (1) Extraction and preparation of fiber from flax straw at low cost, and (2) utilization of this fiber on cotton machinery. Experiments indicate that improved degummed fibers are possible and, with certain modifications in cotton machinery, may be used to produce 100 per cent flax yarns of average counts. Of more immediate interest, is fact that mixtures of cotton or rayon with degummed flax considerably improves latter's spinnability and uniformity, strength, and fineness of yarns produced.

Flax institute provides economic insurance. Paint, oil and chemical review. v.101,no.19. September 14, 1939. p.22. Flax Institute of the United States has been established to act as actuarial agent, insurance organization, to prevent loss of linseed crop, protect interests of growers and manufacturers, and insure ultimate consumer proper price and quality level. Primarily work of crop encouragement is in hands of Institute and every effort is being made to co-ordinate efforts of governmental agencies engaged in this work and private organizations contributing to success of flax industry of this country.

Floods and Flood Control.

Transient flood peaks. By Henry B. Lynch. American society of civil engineers. Proceedings. v.65,no.9. November, 1939. p.1605-1624. Floods of so-called "cloudburst" type yield

Floods and Flood Control. (Cont'd).

momentary runoff peaks entirely out of proportion to rate of rainfall. They are caused by abrupt increase in rainfall and runoff. Their magnitude is controlled by many factors, of which probably most important are rate of increase and intensity of the rainfall.

Flow of Water and Gases.

Stream flow records of Pennsylvania for the year October 1, 1937 to September 30, 1938. Department of forests and waters. Division of hydrography. Prepared in cooperation with the U. S. Department of the Interior Geological survey. Harrisburg, Penna., 1938. 165p. processed.

Granaries.

Build them right; save your corn. By Hadley Read. Iowa agriculturist. v.40,no.3. October, 1939. p.4-5.

Metal cribs repel the rats. By E. W. McMunn. Ohio farmer. v.184,no.7. September 23, 1939. p.15. Safe storage repays cost in saved grain.

This year's corn--where will you store it? By Henry Giese and Henry J. Barre. Successful farming. v.37,no.8. August, 1939. p.10-11,20-21. Cribs are presented as types which have met farm test of service and ranging from low to high in cost, will help you get out of your corn storage perhaps more than you put into it.

U. S. to buy steel bins for corn storage. Farm implement news. v.60,no.16. August 10, 1939. p.36. Secretary of Agriculture Henry A. Wallace has announced plans for increasing ever-normal granary storage facilities in Corn Belt with calling for bids on steel grain bins in quantities adequate to store 50,000,000 bushels of shelled corn.

Heating.

Stoker-fired warm-air furnace in the research residence. By Seichi Konzo. In Papers presented at the Fifth short course in coal utilization held at the University of Illinois May 23-25, 1939. Urbana, Ill., 1939. p.98-112. University of Illinois. Engineering experiment station. Circular no.39.

Houses.

Farm home. In Oregon agricultural experiment station bulletin no.359. p.114-115. Standardization of dimensions of space units in the house. Planning the Willamette Valley farm kitchen. Cost analysis of farm-home construction in Oregon.

Low cost homes. By H. E. Wichers. Manhattan, Kans., 1939. 50p. Bibliography: p.48-49. Kansas state college. Engineering experiment station. Bulletin no.38.

Housing.

Technical activities of government agencies concerned with housing of special interest. Prepared from data assembled by Central housing committee. Washington, D.C., Federal home loan bank board, 1939. 29p. mimeographed.

Hydrology.

Hydrological studies on the Yangtze river, China. IV. On the mechanics of flow in a wide alluvial river. By Shoitiro Hayami. Shanghai, 1931. 239-261p. Journal of the Shanghai science institute. Section 1, vol.1. Separate print no.13.

Insulation.

Include attic insulation. By Robert Gray. Fuel oil journal. v.18, no.4. October 1939. p.17. Fuel savings and summer comfort justify the small investment.

Insulating materials for farm buildings. By C.H. Christopherson. St. Paul, Minn., 1939. 1p. University of Minnesota. Agricultural extension division. Agricultural engineering news letter no.91.

Irrigation.

Individual irrigation of orange trees. By J.W. Dudley. California cultivator. v.86, no.21. October 21, 1939. p.563, 570-571. Standard methods of irrigating gave many orange trees too much water while others got too little or barely enough, and this extra water was evidently responsible for more run down groves and poor trees than any other factor. Suggestion was made that some system of irrigating each tree so that it would get only amount of water that it needed was way to solve this difficulty; that although this system of irrigation might be more expensive than standard methods, saving in water and vastly improved condition of trees might make this very economical and efficient method of irrigation when results were considered.

Fall irrigation is the pay-off. By Keith Carter. Nebraska farmer. v.81, no.22. November 4, 1939. p.3,20.

Irrigating a prairie farm garden. By W.H. Fairfield. Ottawa, Canada, 1939. 4p. Dominion of Canada, Department of agriculture. Experimental station, Lethbridge, Alberta. Circular no.145.

Irrigation, drainage, and ground water. In Oregon agricultural experiment station bulletin no.359. p.110-114. Corvallis, Ore., 1939. Irrigation investigations. Value and efficiency of irrigation in the Willamette valley. Water penetration in heavy clay soil. Soil-moisture availabilimeter and soil-moisture control. Irrigation-water supply forecasting. Drainage and improvement of wet or alkaline soils.

Irrigation. (Cont'd.)

Spring and fall irrigation. By Walter Fitts and R.O. Pierce. Nebraska farmer. v.81, no.18. September 9, 1939. p.5, 15. Make use of water when supply is available.

Sprinkler irrigation in Oregon. By Everett H. Davis. Rural electrification news. v.5, no.1. September 1939. p.3-4. Discusses two types of sprinkler systems available to farmers,- revolving sprinkler system and low-pressure, perforated-pipe system.

Trade possibilities in irrigation. Implement and tractor. v.54, no.16. August 5, 1939. p.14-15, 40.

Water-application efficiencies in irrigation and soil conservation. By O.W. Israelsen. Agricultural engineering. v.20, no.11. November 1939. p.423-425. Observed results of irrigation practices in Utah valleys, together with analyses and preliminary data presented, seem to justify following tentative conclusions: 1. Low water-application efficiencies and resulting deep-percolation losses (or lack of conservation of irrigation water) on Class 1 soils may not cause rapid depletion of soil fertility. However, such irrigation practices on Class 1 soils cause decrease in productivity of Class III soils in some valleys by contributing to rise of ground water and concentration of alkali. 2. In Class I soils amount of water consumed is smaller than amount of irrigation water applied; in Class II soils amount consumed is more nearly equal to amount applied, and in Class III soils not adequately drained amount consumed usually exceeds amount applied. 3. Irrigators may contribute to water conservation by increasing water-application efficiencies on all three classes of soils, and also thus contribute especially to conservation of Class III soils by prevention of water logging and alkali concentration. 4. By decreasing water-application efficiencies for periods of few years, and thus causing large deep percolation losses in artificially drained Class III soils, irrigators may contribute to conservation of these soils and thus justify water losses. 5. Measurements of water-application efficiencies by public research agencies merit more attention than they have been given thus far.

Irrigation Water.

Controlling alkali with gypsum. By W.T. McGeorge. Pacific rural press. v.138, no.1. July 15, 1939. p.31. Application of gypsum in irrigation water offers best solution. It is economically feasible and practical. Best way to look upon this practice is as cheap form of insurance on structure of soil and surely no part of farm warrants insurance more than soil itself.

Irrigation Water. (Cont'd.)

Irrigation district water distribution. By Robert Bowman Van Horn. Reclamation. v.2, no.10. October 1939. p.9-10. Author points out few interesting and essential facts about supplementary systems.

Salinity of the Connecticut river, October 1, 1934 to September 30, 1937. Issued by the Works progress administration for Connecticut state water commission, sponsor, prepared under direction of the Geological survey, U.S. Department of the Interior. Hartford, Conn., 1938. Parts 1-3. Connecticut ground water survey. Bulletin no. S-1.

Kitchens.

Convenient kitchens. By Julia Pond and Helen Noyes. East Lansing, Mich., 1939. 32p. Michigan state college. Extension bulletin no.185 (rev.)

Koroseal.

Rubber's "Little brother". By Florian E. Wood. Scientific American. v.161, no.1. July 1939. p.20-21. Rubber-like material, Koroseal, made of limestone, coke, salt. Superior to rubber in several ways. Not yet adapted to automobile tires. Koroseal products are resistant to moisture, oxygen, ozone, strong acids and alkalies, and most corrosive chemicals. Typical applications are wire and cable insulation and sheathing, textile roll covering, tank lining, pipe covering, coating for plating racks, chemically-resistant tubing, impregnated fabrics.

Land clearing.

Helping farmers to clear land. By Larry Moore. Electrical world. v.112, no.11. September 9, 1939. p.758, 760.

Land clearing. By R.N. Miller. Reclamation. v.2, no.10. October 1939. p.7-8, 10. Methods and costs are given of an enterprise of vital importance to the Pacific northwest.

Leather.

Making leather at home. Farmer's digest. v.3, no.5. September, 1939. p.72-74.

Lubrication.

Diesel engine lubrication. By C.J. Copley. Southern power and industry. v.57, no.11. November 1939. p.66-68, 70,72. Knowledge of certain basic factors is essential to intelligent selection of lubricating oil, but highly technical terms and formulas are not necessary.

Miscellaneous.

A.S.M.E. today. Mechanical engineering. v.16, no.10. October, 1939. p.745-747.

Technical museums in Soviet Russia. By H. Philip Spratt. Mechanical engineering. v.61, no.10. October, 1939. p.735-739.

Models.

River models outwit nature. By Paul W. Thompson. Scientific American. v.161, no.3. September 1939. p.140-142. Miniatures of rivers, harbors, dam projects solve flood and flow problems. Considerable design ingenuity involved in model making.

Motor Fuel.

Ersatz motor fuels. By Gustav Egloff. Scientific American. v.161, no.1. July, 1939. p.5-7. Eighteen percent of motor fuel consumed in Europe during 1937 consisted of substitutes for gasoline. Substitutes used range all way from solid substances such as wood and coal to compressed gases of several kinds. Off-hand this might seem to indicate great saving since cost of imported gasoline is extremely high in Europe as compared with gasoline cost to American motorists. By use of substitutes, however, Europe lost approximately $235,000,000 during 1937. Yet 1938 showed increase up to 25 percent of all motor fuel used and loss of about $300,000,000 through subsidies and taxes. Use of power alcohol in Europe is steadily declining.

Precision of knock rating -- 1936-1938. By Donald B. Brooks and Robetta B. Cleaton. S.A.E. journal. v.45, no.4. October, 1939. p.449T-456T. Report from cooperative fuel research committee.

Motors, Electric.

Applying integral horsepower electric motors to farm equipment. Agricultural engineering. v.20, no.11. November, 1939. p.430. For eleven farm machines investigated, 120 manufacturers reported that they had developed 596 models designed for electric-motor drive. Of these, 334 were water systems, making up more than one-half of total. Other ten ranged from three grain blowers, lowest number, to 73 for ensilage cutters, highest. Gives statistics for all machines.

Pest Control.

Developments in germicidal lamps. By L.C. Porter. Agricultural engineering. v.20, no.11. November, 1939. p.437-438.

Pest Control. (Cont'd.)

Short-wave radiation in the control of fungi and bacteria. By Samuel G. Hibben. Agricultural engineering. v.20, no.11. November, 1939. p.438.

Pipes and Piping.

Discussion of the new law of design of cast iron pipe. By W.D. Moore. American water works association. Journal. v.31, no.10. October, 1939. p.1655-1674. Data on breaks of cast iron pipe. Research program. Relationship of internal pressure and external load. Pit cast pipe specifications. Factors in safety. Graphs developed.

Plastics.

Fundamental characteristics of moldable plastics. By Gordon Brown. S.A.E. journal. v.45, no.4. October, 1939. p.9-12. Purpose of paper to clarify relative properties of most important present day moldable plastics so that selection of proper material may be determined more easily. Brings out that, if one single property is desired above all others in molded piece, that there is usually some compromise or sacrifice in other properties that must be made when selecting right material.

Plows and Plowing.

Early steam plow. Pennsylvania farmer. v.121, no.10. November 4, 1939. p.190. More than three score years ago Thomas S. Minniss of Meadville, Crawford County, book binder and inventor, designed and built steam plow which embodied principle of revolving track which machine itself laid down to run on.

Science plows ahead. By Arnold Skromme. Iowa agriculturist. v.40, no.4. November, 1939. p.8. New plowing device reduces friction, shaves fuel bill and lays a more level furrow.

"Spider" plow fights forest fire by making wide trench. Popular mechanics. v.72, no.5. November, 1939. p.666. Forms fire break two and one-half feet wide. Five-horse-power outboard motor rotates digger.

Poultry Houses - Lighting.

Artificial illumination of poultry laying houses for winter egg production. By F.L. Fairbanks and G.F. Heuser. Ithaca, N.Y., 1939. 41p. New York State college of agriculture. Cornell extension bulletin no.411.

Poultry Houses and Equipment.

Poultry house temperatures. By H.E. Besley. New Jersey agriculture. v.21, no.4. July-August, 1939. p.3. Roof treatment. Insulation and auxiliary heat.

Pumps and Pumping.

Centrifugal pumps designed for underground waters. By A.O. Fabrin. American water works association. Journal. v.31, no.10. October, 1939. p.1675-1683.

Irrigation pumping plants; Construction and costs. By M.H. Davison. Report of the Kansas State board of agriculture, Division of water resources for the quarter ending June, 1939. Topeka, Kans., 1939. 52p.

Vertical pump applications. By Julo H. Coffey. American water works association. Journal. v.31, no.10. October, 1939. p.1684-1690.

Reclamation.

Once over the Central Valley project. By D.M. Rutherford. Pacific rural press. v.138, no.1. July 15, 1939. p.30-31.

Reclamation of saline (alkali) soil in the Yakima Valley, Washington. By C.A. Larson. Pullman, Wash., 1939. 39p. State College of Washington. Agricultural experiment station. Bulletin no.376.

Refrigeration on Cars, Trucks, etc.

New service provides low-temperature refrigeration for LCL shipments. Domestic commerce. v.24, no.10. October 10, 1939. p.188. Railway Express Agency has designed and put into service container, called Church container after its inventor, which is about size of large trunk, mounted on casters, and with space for 100 pounds of "dry ice", or 90 pounds of water ice. Container can be loaded with food packages and refrigerant at shipper's warehouse, and hauled to express car. It has 10 cubic-foot capacity for merchandise. Shipper provides refrigerant, and in addition to regular express charges, pays service fee for use of container.

Overhead bunkers for refrigerator cars. By O.C. Walker. Refrigerating engineering. v.38, no.3. September, 1939. p.145-149. Shows economic development involved, tracing generation of experience and experiment. Details of construction and test data are cited.

Recent German researches on the transportation of foods. By A.A. Berestneff. Refrigerating engineering. v.38, no.3. September, 1939. p.151-152. Cooling rate of end bunkers compared with top bunkders.

Refrigerator Lockers.

Urban locker plants. By A.A. Geiger. Refrigerating engineering. v.38, no.3. September, 1939. p.130, 178-179. Advantages to the urban patron are: that he may purchase his meats for his locker through custom butcher at wholesale prices plus small brokerage fee.

Research.

Agricultural research serves to relieve the tax burden; Biennial report, Oregon agricultural experiment station, 1936-1938. By R.S. Besse. Corvallis, Oreg., 1938. 132p. Oregon agricultural experiment station. Bulletin no.359.

Hunt new uses for corn. By De Witt C. Wing. Kansas farmer. v.76, no.22. November 4, 1939. p.18-19. Discusses research to be carried on in regional research laboratories.

New uses for fruits. By H.E. Barnard. Farmer's digest. v.3, no.3. July, 1939. p.63-66.

Preview of regional research laboratories. By Henry G. Knight. Extension service review. v.10, no.11. November, 1939. p.162-163.

Reservoirs.

Small reservoirs for stock water and irrigation. By O.W. Monson. Bozeman, Mont., 1939. 33p. Montana state college. Agricultural experiment station. Circular no.154.

Storage reservoirs, Yakima project, Washington. By D.E. Ball. Reclamation era. v.29, no.9. September, 1939. p.234-235.

Roofs.

Survey of roofing materials in the Northeastern states. By H.R. Snoke and L.J. Waldron. Washington, U.S. Govt. print.off., 1939. 27p. U.S. National bureau of standards. Building materials and structures. Report no. B.M.S.29.

Watch out for the wind. By Herbert A. Sweet. Factory management and maintenance. v.97, no.9. September, 1939. p.71-73. Roof may go in the next stiff blow unless the maintenance department recognizes wind damage dangers and prepares to meet them.

Run-off.

Preliminary study of variability of run-off plots. By B.H. Hendrickson. Soil conservation. v.5, no.5. November, 1939. p.128-130. Article reports very recently acquired preliminary run-off data obtained from some plots, with interpretive discussion.

Sewage Disposal.

Farm sewage disposal. In Annual report of the Maine extension service for the year ending June 30, 1939. Orono, Me., 1939. p.14. University of Maine. College of agriculture. Extension bulletin no.267.

Silos.

Baled hay silo. By Merritt W. Bradshaw. California cultivator. v.86, no.16. August 12, 1939. p.444. Bales were arranged in circle with diameter of approximately eighteen feet. Heavy no.9 wire was placed around bales and small pulley was attached to one end. Other end was run through pulley and cinched up tight. On reaching height of about five feet construction was temporarity stopped and inside of silo was lined with heavy building paper to make walls as air tight as possible in order to protect contents against spoilage. Ensilage was then cut and blown into silo. As silo was filled it was also extended farther into air. When it reached its full height, which was around twenty feet, top was covered with heavy building paper same as sides. Loose hay was spread over paper and baled hay placed on top.

Stack silo for bundled feed. By C.H. McDonald. Farm and ranch. v.58, no.8. August, 1939. p.18. Feed is cut and hauled in green bundles direct from field and is stacked close to supply of water. Bundles are laid close and carefully by hand, after which, binds are cut and feed is pressed down to exclude all air pockets. Between loads, water is pumped onto feed in process of stacking for purpose of giving weight so that green feed will settle rapidly. Water also serves to start early fermentation. In green and succulent feed only barrel or two of water is required for each ton of green feed; however, if feed is dry and fired, due to drouth conditions, more water is required to start fermentation and to give proper settling. In stacking feed, bundles are placed with butts out and in consecutive layers. Walls must be kept even and straight, and top must be level at all times during process of construction. Very little additional labor is needed for construction of this kind of silo except that involved in supplying water. Stack silo is cheap way of storing succulent feeds for consumption on farm in winter months and through drouth periods. Such silo requires no additional cost for materials, and only implements needed for this method of storing feed are row binder, shovel, and ax or hay knife, together with good supply of water to put on feed during the stacking process.

Stack silo for bundled feed. By C.H. McDonald. Farmer's digest. v.3, no.6. October, 1939. p.59-60.

Temporary silos. By C.H. Jefferson. Farmer's digest. v.3, no.3. July, 1939. p.47-49.

Soil Moisture.

Heat conductivity as an index of soil moisture. By Byron Shaw and L.D. Baver. American society of agronomy. Journal. v.31, no.10. October, 1939. p.886-891. Conclusion: Results of these studies point out that first three objectives of this investigation have been achieved, namely, (1) it has been possible to devise apparatus for measuring changes in heat conductivity of soil at various moisture contents; (2) it has been established that heat conductivity gives reliable index of moisture content of soil; and (3) it has been shown that changes in salt concentration of soil solution do not materially affect heat conductivity of soil. Work is now in progress to achieve fourth objective, that is, to adapt principle of heat conductivity to measuring moisture of soil "in situ".

Soils.

Soils for irrigation. By F.K. Nunns. Montana farmer. v.26, no.23. August 1, 1939. p.1, 23. Porous surface and good subsoil drainage essentials of adequate permeability.

Spillways.

Design of a high-head siphon spillway: discussion. By I.M. Nelidov. American society of civil engineers. Proceedings. v.65, no.9. November, 1939. p.1641-1646.

Tires.

Effect of tire sizes on tractor efficiency. By R.H. Wileman. Northwest farm equipment journal. v.53, no.9. September, 1939. p.41-42. Table I - Effect of tire size on tractor efficiency; two plow tractor pulling 2-16" bottom plow 8" deep. Table II - Effect of tire size on tractor efficiency; three plow tractor pulling 3-14" bottom plow 7" deep.

Rural revolution on rubber. By F. Hal Higgins. Pacific rural press. v.138, no.4. August 26, 1939. p.110-111. Summary of farm revolution on rubber to date reveals: I. Faster field operations. 2.Tractor operator now sitting instead of standing on his tractor. 3.Family farming system being established for more security against labor problems. 4.More brain and less brawn work in managing farm on rubber. Shorter hours in field and less fatique of farmer gives him time to think and plan. 5.More vacation and recreation time on farm for entire family. 6.More educational time for school and college work for farm boys and girls. 7. More social opportunities because of extra time for travel and visiting. 8. Lighter and cheaper farm machinery coming from cushioning effect.

Tires. (Cont'd.)

Traction tests of single pneumatic tires versus dual pneumatic tires. By E.C. Sauve. East Lansing, Mich., 1939. Michigan agricultural experiment station. Quarterly bulletin. v.22, no.2. November 1939. p.59-71.

Transport wheels for agricultural machines. By E.G. McKibben and H.J. Thompson. Agricultural engineering. v.20, no.11. November, 1939. p.419-422. Comparative performance of steel wheels and pneumatic tires on two manure spreaders of the same model. Investigations which furnish data reported in paper were undertaken because it seemed logical to supplement detailed studies of individual wheels by tests of at least one pair of complete machines. Principal tests used and general results obtained are given.

Tractors.

Electric tractor for hotbeds performs multitude of tasks. Popular mechanics. v.72, no.5. November 1939. p.731. More than score of cultivating operations are performed by electric tractor developed in Soviet Russia for working hotbeds. Driven by a three-kilowatt motor, it moves along row of hotbeds, opening glass frames by mechanical levers and then closing frames as it moves on. By manipulating various levers in cab, operator can distribute soil, level it, mark out rows, sow vegetables, water them, weed, fertilize and cultivate plants, and do various other tasks. Tanks on tractor carry water, chemical sprays and fertilizers. Use of tractor is said to raise yield of hotbeds forty to eighty per cent.

Farmall-H and Farmall-M assume the illustrious mantle of the original Farmall. Farm implement news. v.60, no.16. August 10, 1939. p.40-42.

Longer tractor engine life is theme of S.A.E. meeting. Implement and tractor. v.54, no.21. October 14, 1939. p.18, 43-45.

New method of grouping tractors is suggested. By J.B. Torrance. Implement and tractor. v.54, no.16. August 5, 1939. p.18. It is proposed that classification be made on basis of drawbar rating only, because tractors are purchased primarily for drawbar work. They are usually used for larger number of drawbar operations than for belt work, and power limit is usually encountered in drawbar work rather than in belt work.

Tractors. (Cont'd.)

New Soviet tractor performs twenty-two operations. Science news letter. v.36, no.8. August 19, 1939. p.124-125. New kind of electrical tractor that cultivates hotbeds mechanically with increased yields is being demonstrated on large hotbed area of agricultural exhibition grounds in Moscow. Invented by Vagan Mkrtchian, new hotbed combine performs 22 different operations, according to Tass report. It is small machine that looks somewhat like old-fashioned limousine. It moves along hotbeds from one row to another, opens their glass frames as it approaches and closes them again when it moves on. Operator manipulates several levers in his cab, and machine performs various processes of cultivation and sowing in hotbeds. It brings soil to hotbeds, scatters and levels it, marks out rows, sows vegetables, waters them, weeds, adds fertilizers, sprays chemicals, pollinates plants, etc. Design of machine is very simple. Its metal frame is equipped with levers which open and close glass frames, thus ventilating hotbeds. Special tanks are mounted for water, mineral fertilizers and spray liquids. In autumn and early spring when no watering is needed, tanks are replaced by conveyor belt for manure, soil, snow, etc. Attached to combine are special devices, including soil leveler, row marking and sowing machine, cultivator, machine for earthing up, harvesting platform and special attachment for production of naphthalene gas to combat field pests. Combine is propelled by 3-kilowatt electric motor. Mechanized cultivation is claimed to raise harvest yield in hotbeds by 40 to 80 per cent. It takes combine eight hours to till 2.6 hectares (6 1/2 acres) of hotbeds and one minute to sow area of 36 square meters (43 square yards).

"Offset" tractor allows a clear view of row. Popular mechanics. v.72, no.5. November, 1939. p.703. Two light-weight tractors built for small farm and for utility jobs around big farm have just appeared on market. One, built by Ford, has hydraulic controls which permit automatically controlling implement to any desired depth in ground regardless of surface irregularities. Tractor and unit implement are so closely coupled that they can work in corners and small irregular plots too small for horses. Tractor and tools are combined in one unit; for row crop cultivation, cultivator can be attached in few seconds without tools. New International Harvester company tractor has "offset" seat on right, motor being mounted forward at left, so that farmer has always clear view of row as he cultivates. In contrast with early tractors made by same company, it weighs about 1,700 pounds, less than weight of flywheel of old-time implements.

Tractor costs in Michigan, 1938. By F.M. Atchley. East Lansing, Mich., 1939. Michigan agricultural experiment station. Quarterly bulletin. v.22, no.2. November, 1939. p.91-96.

Tractors. (Cont'd.)

Tractor overheating; causes and remedies. Manhattan, Kans., 1939. 10p. mimeographed. Kansas state college of agriculture and applied science. Extension service. Circular no.21.

Tractor schools. In Annual report of the Maine extension service for the year ending June 30, 1939. Orono, Me., 1939. p.12-13. University of Maine. College of agriculture. Extension bulletin no.267.

Winter care of the tractor. Southern planter. 100th year, no.12. December, 1939. p.16.

Trucks.

Motor trucks now necessary equipment. Farm machinery and equipment. no.1866. June, 1939. p.7-9. More than 50 percent of livestock receipts are "drive-ins".

Tung Oil.

Southern tung oil laboratories. By R.S. McKinney. Manufacturers record. v.108, no.8. August, 1939. p.54. Primary object is to speed development of domestic tung oil industry along safe, sound and profitable channels. Technological research investigations to be carried on will deal with better production and utilization of tung oil and tung oil byproducts. Studies will be made of content and characteristics of oil in tung fruits as influenced by various cultural factors, and by storage conditions.

Ventilation.

Fresh air in farm buildings. By H.N. Stapleton. Agricultural engineering. v.20, no.11. November, 1939. p.426.

Ventilation of tobacco barns. By R.A. Hunt and J.B. Brooks. Lexington, Ky., 1939. 19p. University of Kentucky. Extension division. Circular no.335.

What do you mean "Ventilate?" By H.N. Stapleton. Electricity on the farm. v.12, no.11. November, 1939. p.13-14. Barn "ventilation" really is air conditioning. We build barns to condition the air around the cows. The electric system is positive and may be cheaper than a gravity system.

Walls.

Structural properties of a brick cavity wall construction sponsored by the Brick manufacturers association of New York, inc. By H.L. Whittemore, A.H. Stang and D.E. Parsons. Washington, U.S. Govt. print. off., 1939. 12p. National bureau of standards. Building materials and structures. Report no.BMS23.

Structural properties of a reinforced brick wall construction and a brick-tile cavity-wall construction sponsored by the Structural clay products institute. By H.L. Whittemore, A.H. Stang and C.C. Fishburn. Washington, U.S. Govt. print. off., 1939. 17p. "Selected references": p.17. U.S. National bureau of Standards. Building materials and structures. Report no. BMS24.

Structural properties of a wood frame wall construction sponsored by the Douglas fir plywood association. By H.L. Whittemore and A.H. Stang. Washington, U.S. Govt. print. off., 1939. 14p. "Selected references": p.14. U.S. National bureau of standards. Building materials and structures. Report no.BMS30.

Structural properties of "Dun-to-Stone" wall construction aponsored by the W.E. Dunn manufacturing company. By W.H. Whittemore, A.H. Stang and D.E. Parsons. Washington, U.S. Govt. print. off., 1939. 11p. National bureau of standards. Building materials and structures. Report no. BMS22.

Structural properties of "Nelson pre-cast concrete foundation" wall construction sponsored by the Nelson Cement Stone company, inc. By H.L. Whittemore, A.H. Stang and C.C. Fishburn. Washington, U.S. Govt. print. off., 1939. 10p. U.S. National bureau of standards. Building materials and structures. Report no. BMS26.

Structural properties of "Pre-Fab" constructions for walls, partitions, and floors sponsored by the Harnischfeger corporation. By H.L. Whittemore, A.H. Stang and V.B. Phelan. Washington, U.S. Govt. print. off., 1939. 20p. U.S. National bureau of standards. Building materials and structures. Report no. BMS18.

Structural properties of "Steelox" constructions for walls, partitions, floors, and roofs sponsored by Steel Buildings, inc. By H.L. Whittemore, A.H. Stang, and V.B. Phelan. Washington, U.S. Govt. print. off., 1939. 17p. U.S. National bureau of standards. Building materials and structures. Report no. BMS12.

Walls. (Cont'd.)

Structural properties of "Twachtman" constructions for walls and floors sponsored by Connecticut pre-cast buildings corporation. By H.L. Whittemore, A.H. Stang and D.E. Parsons. Washington, U.S. Govt. print. off., 1939. 13p. U.S. National bureau of standards. Building materials and structures. Report no. BMS20.

Water, Underground.

Black lands experimental watershed ground water graphs, 1936-37. By W.D. Potter and H.R. Blank. Washington, U.S. Soil conservation service, 1939. 21 numb.l. Mineographed.

Ground water studies. In Forty-ninth annual report for the year ending June 30, 1938, Agricultural experiment station, University of Arizona. Tucson, Arizona, 1939. p.18-20.

Water Conservation.

Conservation of water by using cooling towers and evaporative condensers. By S.I. Rottmayer. Urbana, Ill., 1939. p.127-137. University of Illinois. Engineering experiment station. Circular no.37.

Farm ponds in soil and moisture conservation. By H.G. Jepson. Soil conservation. v.5, no.4. October, 1939. p.77-82.

Storage on the Salt river project. By T.A. Hayden. Reclamation era. v.29, no.9. September, 1939. p.235-238.

Strip-farming and the Basin lister. By Frank H. Harper. Reclamation. v.2, no.10. October, 1939. p.15-16. Article describes example of cooperation in aiding farmers of the Dakotas and Montana in general and Bottineau county in particular in definite plan for soil erosion control and moisture saving.

Water heaters.

Time for water warmers. By Wallace George. Electricity on the farm. v.12, no.11. November, 1939. p.9-10.

Water Requirements of Plants.

Relative water requirement of Arizona range plants. By W.G. McGinnies and J.F. Arnold. Tucson, Ariz., 1939. 246p. "Literature cited": p.246. Processed. University of Arizona. Agricultural experiment station. Technical bulletin no.80.

Water-culture and its scientific future. By Paul Chatelier. Florida grower. v.47, no.10. October 1939. p.5,13. Observations following sixteen months' tank culture experiments in Florida.